

INITIAL ENVIRONMENTAL EXAMINATION Gomal Zam Dam Irrigation Development

PROGRAM/ACTIV	ITY DATA:			
Country:	Pakistan			
Objective:	To provide economic opportunities to an under-developed area of South Waziristan, which is vulnerable to extremism, by completing the irrigation system associated with WAPDA's high priority project of Gomal Zam Dam.			
Activity Name:	Activity Name: Gomal Zam Dam Irrigation Development			
Funding Begins: FY	2010 Funding Ends: FY	2011 LOP Amount: (est.)	\$70 million	
IEE Prepared By: C	Carrie Abendroth	Date: December 13, 201	0	
IEE Amendment (Y/	(N) : No			
ENVIRONMENTAI	L ACTION RECOMMEND	ED: (Place X where application)	able)	
Categorical Exclusion Positive Determinatio With Conditions		Deferral Negative Determination Exemption		

1.0 BACKGROUND AND PROGRAM DESCRIPTION

1.1 Purpose and Scope of IEE

The purpose of this initial environmental examination (IEE), in accordance with 22 CFR 216, is to provide a specific review for the Gomal Zam Irrigation Development Project of the reasonably foreseeable effects on the environment and provide the threshold decision. This

IEE provides a brief statement of the factual basis for the threshold decision based on available documents and the description of the project. This irrigation project will complete USAID's support for construction of the Gomal Zam Dam Project.

1.2 Background

Gomal Zam Dam is a multi-purpose hydropower project that will provide energy, irrigation, and water storage benefits to the local residents of South Waziristan. The project site is located at an isolated area near the Gomal River about 60 km west of Tank and D.I. Khan in South Waziristan Agency of the Federally Administered Tribal Areas (FATA). This river is basically dry nine months of the year and is flooded with water during the summer monsoon months.

The basic objectives of USG support to develop the irrigation system are: (1) Provide economic opportunity in an underdeveloped area that is vulnerable to extremism and (2) Increase acreage under irrigation to increase agricultural productivity, and, thus, incomes and economic activity.

The completion of the Gomal Zam Dam Irrigation System would build on USG counter-insurgency (COIN) efforts in the Federally-Administered Tribal Areas. A \$70 million (current cost estimate) investment will complete the irrigation system, bringing an additional 191,062 acres under irrigation.

The irrigation network is only 12% complete (estimate as of May 2010) and it is estimated that it will take 2-3 years to complete.

A detailed feasibility study for the Gomal Zam Irrigation system project was completed by Coyne-et-Bellier, France in 1983 and later revised in 1995. The main dam and water storage area was gifted by the 'Maliks' (elders) of South Waziristan to the Pakistan Water and Power Distribution Authority (WAPDA) free of cost. The project is thus considered to have the support of local FATA elders.

1.3 Prior Environmental Reports & Description of Activities

In Pakistan, WAPDA's environmental unit is responsible for finalizing environmental reports. In some cases, the feasibility study consultant also completes an Environmental Impact Assessment (EIA) for the project. Under the Pakistan Environmental Protection Act, no project involving construction activities or any change in the physical environment can commence without the drafting of an IEE or Environmental Impact Assessment (EIA) and submission to the Federal or Provincial Environmental Protection Agency (EPA). In the case of Gomal Zam,

USAID's Energy office is funding the completion of the hydropower Gomal Zam Dam, which has a separate IEE. Asia 10-12 Pakistan IEE and ETD Gomal Zam Dam completion. See USAID IEE Asia 10-12, Gomal Zam Dam Completion, dated August 17, 2010 and the Gomal Zam Environmental Mitigation Monitoring Plan (EMMP) found in the USAID/Pakistan Environmental files.

Coyne-et-Bellier (France) was hired as a feasibility study consultant and completed an EIA in 1995, which was included in the PC-1. The PC-1 was approved in August 2001 by the Executive Committee of the National Economic Council (ECNEC) of Pakistan. Unfortunately, no GOP agency approved the EIA.

The construction of the project was discontinued in 2004 because of security reasons. A contract for the dam, including hydropower generation and the irrigation facilities just near the FATA boundary and the canal/distributaries, was later awarded to the Frontier Works Authority (FWO) in 2007. The two sub-contractors are Sino-Hydro which is responsible for the dam and hydropower component, and Tekser with responsibility for the irrigation component of the contract.

The main dam, hydropower plant and other associated works are at advanced stages of construction at about 87% complete. A 132 Kv double circuit 55 km transmission line from the dam site to the Tank grid station is being constructed by the Peshawar Electric Supply Company (PESCO), a subcontractor to WAPDA. The irrigation network is only 12% developed, and an independent consultant estimated that it could be completed in 2 to 3 years.

The progress of this project is summarized below:

No.	Description of Work	Completion Status (As of July 1, 2010)	Outstanding Works
1.	Dam and Power House (FWO/Sino-Hydro)	87.3%	12.7%
2.	Irrigation System (FWO/Tekser)	12.1% (as of May 2010)	87.9%
3.	132 kV Power Transmission Line	15.0 % (50% Advance paid to PESCO)	85.0 %

The dam, powerhouse and transmission line are under a separate GOP planning document from the irrigation component, and are subject to a separate IEE (ASIA 10-12 Pakistan IEE & EDT, dated August 17, 2010).

Construction works under this IEE include:

A. Diversion Barrage at Kot Murtaza

This diversion barrage will raise the level of water to divert the required amount to the main canal, reduce fluctuations of the level of the river, control silt entry into the canal, and provide for a more steady flow of water into the system. This barrage is an un-gated

permanent structure of 140 m in length and 46 m in width. Its maximum capacity is 4,000 m³/s and the sluice section can evacuate 1,000 m³/s. Under maximum flood conditions, the maximum water level will remain slightly below elevation of 384.65 m, thereby providing flood protection to houses, training works and the head regulatory protection wall.

B. Irrigation System

1. Main canal

The main canal lay-out is virtually unchanged from the current distribution system. It will off-take from the Kot Murtaza barrage, follow the left riverbank as far as Gomal village, then turns away from the river. It will have 1.5:1 side slopes throughout and will be lined by 10 cm of concrete. Its bed width varies from 3 m at the head to 0.75 m at the tail and a large number of falls is included that have been standardized at 1.52 m. The distribution structures incorporate three principal road crossings. Most of the canal route avoids cross-drainage problems, except for Kot Azam Nala (small river or creek) where a double-barreled siphon will take the canal under the Nala. The maximum discharge is 24 m³/s during the peak month of March.

2. Distributaries

As with the main canal, the distributaries downstream of Mian Nur have been virtually unchanged. There are nine distributaries to the left and four to the right. The latter is longer and larger than the others. In the left bank perennial area, since the present system appears to distribute available water efficiently, it is proposed to solely line the canals. Distributaries are 1 m in width at the top of the bank, an inside slope of 1:1 and an outside slope of 1.5:1.

3. Drains

Drains are located parallel to and alongside the canal immediately downstream of Mian Nur to reduce flood damages from the upstream side. On the left, the eleven main drains discharge either into a collector or a flood control canal. Drain depths to ensure proper discharge are continually under review as construction moves forward.

4. Flood protection channel

To protect irrigated areas from flooding from the Tank Zam and other northern channels, a flood protection channel will be built mainly through improvement to the Kaur Nala and a section of the Gomal River downstream. A few new sections will be added to link these smaller rivers together. The embankment is designed to contain a 1 in 100-year flood from the Tank Zam, Kaur and Kiriani Nalas.

2.0 COUNTRY AND ENVIRONMENTAL INFORMATION (BASELINE INFORMATION)

Studies conducted by the Government and donor agencies^{[1],[2],[3]} in Pakistan have highlighted a number of environmental issues. Broadly, the areas of concern identified include water, energy, pollution and waste management, irrigated agriculture, and biodiversity. Overall, these studies reveal deterioration in all these areas. The increasing pollution of water, air, and land continues to have an enormous impact on people's health, especially that of vulnerable groups such as children. The quality and quantity of renewable natural resources such as water, forests and other vegetation, and key biological habitats have declined. The Government, private sector, and civil society have not responded adequately to meet these challenges, although there have been some exceptions, such as the switchover to cleaner fuels in the transport subsector.

3.0 NATIONAL ENVIRONMENTAL LEGISLATION[4],[5]

3.1 Pakistan Environmental Protection Act 1997

The Pakistan Environmental Protection Act, 1997 is the basic legislative tool empowering the government to frame regulations for the protection of the environment. This Act broadly applies to air, water, soil and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those who contravene the Act's provisions. The powers of the Federal and Provincial Environmental Protection Agencies (EPAs) were also considerably enhanced under this legislation and they have the power to conduct inquiries into possible breaches of environmental laws either of their own accord, or upon the registration of a complaint.

Under this Act, no project involving construction activities or any change in the physical environment can commence unless the fulfillment of prerequisite to conduct an IEE or EIA and submittal of a report to the Federal or Provincial EPA.

3.2 Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations 2000

The PEPA review of the 2000 IEE and EIA regulations (the 'regulations') provides the necessary details on the preparation, submission and review of the IEE and the EIA reports. The regulation

^[1] Pakistan Infrastructure Implementation Capacity Assessment (PIICA) World Bank Report No. 41630-PK at: http://siteresources.worldbank.org/SOUTHASIAEXT/Resources/Publications/448813-1202436185914/PIICfull.pdf [2] Pakistan Strategic Country Environmental Assessment (in two volumes) World Bank Report No. 36946-PK at: http://siteresources.worldbank.org/SOUTHASIAEXT/Resources/Publications/448813-

^{1188777211460/}pakceavolume1.pdf and

http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/0,.contentMDK:21459418 [3] Pakistan's Water Economy Running Dry at: http://www-

wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/06/25/000333037 20080625013311/Rend ered/PDF/443750PUB0PK0W1Box0327398B01PUBLIC1.pdf
[44] http://www.environment.gov.pk/

http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwepak.htm

classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules. Schedule-I lists projects that may not have significant environmental impacts and therefore require an IEE. Schedule-II lists projects of potentially significant environmental impacts requiring preparation of an EIA. However, it may be noted that this regulation does not have any other category for equipment procurement projects.

3.3 National Environmental Quality Standards (NEQS) 2000

First promulgated in 1993, the NEQS were last amended in 2000. These constitute the basic guidelines with which municipal and industrial origin liquid effluent and gaseous emissions must comply. These standards present the maximum allowable concentration for liquid effluent before its discharge into sea, inland water and sewage (total 32 parameters with which to comply) and gaseous emissions in the ambient air from industrial sources (total 16 parameters with which to comply).

4.0 EVALUATION OF PROJECT ISSUES WITH RESPECT TO ENVIRONMENTAL IMPACT POTENTIAL

All of the activities under Section 1.3 were identified and addressed by an Environmental Impact Assessment (EIA) finalized by Coyne-et-Bellier in 1995. The purpose was to evaluate any environmental impacts during the construction and operation phase of the project and to prepare a mitigation program to minimize adverse affects.

The content of the 1995 EIA was designed to meet the standard guidelines of the World Bank and the Asian Development Bank.

The Coyne-et-Bellier EIA report concluded the following:

- (i) No major resettlement issues; as there is no inhabitation within the vicinity of the Dam, reservoir and power house.
- (ii) No significant loss of any rare flora is foreseen since the dam is located in Rocky Mountains with no vegetation.
- (iii) No significant reduction in fish production or population is expected. The dam could stop the migration of few species along the Zhob river e.g., Tor Putitora, Naziritor Zhobensis. However, due to large reservoir area the fish population is expected to increase. New fish species could be introduced and commercial fishing could be initiated.
- (iv) Minor probability of land slide occurring within a 1.5 km radius of the dam site.
- (v) No significant loss of any rare and endangered species as the dam is located in a barren area. Among endangered species, only population of the migrant bird Houbara Bustard could be affected due to destruction of some its habitat by irrigation system.
- (vi) There will be a minor impact on natural fertilization of the downstream soil due to sediment patterns. This could be mitigated using a suitable fertilization program.

(vii) As far as socio-economic impacts of the projects are concerned, the most important affect will be savings from flood damages in the form of losses of agricultural land, houses, livestock, infrastructure, roads and human lives (estimated annual damage USD\$2.6 million).

Overall 12% of the irrigation system has been completed by the Frontier Works Organization (FWO), which was responsible for satisfaction of safety and environmental standards during construction. FWO is supervised by consortium of consultants: National Development Consultants, Lahmeyer International, ECIL, EPSILON and BAK.

4.1 Environmental Assessment Guideline Reference Documentation

If required, provided below is a list of references for preparation of an Environmental Mitigation & Monitoring Plan (EMMP).

- Environmental Guidelines for Small-Scale Activities: (http://www.usaid.gov/locations/latin_america_caribbean/environment/docs/epiq/epiq.html and http://www.encapafrica.org/egssaa.htm)
- World Bank Environmental Assessment Handbook and Updates: (http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVASS /0,.contentMDK:20282864~pagePK:148956~piPK:216618~theSitePK:407988,00.html)
- World Bank Pollution Prevention and Abatement Handbook: (http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/p_ppah/\$FILE/PPAH.pdf)
- IFC Environmental, Health and Safety Guideline (http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines.)
- 5. ERBD Sub-Sectoral Environmental and Social Guidelines at: http://www.ebrd.com/about/policies/enviro/sectoral/
- Environmental Handbook, German BMZ at:
 http://ces.iisc.ernet.in/energy/HC270799/HDL/ENV/enven/begin2.htm#Volume%20II:%20A griculture,%20mining-energy,%20trade-industry
 http://ces.iisc.ernet.in/energy/HC270799/HDL/ENV/enven/begin1.htm#Volume%20II:%20A griculture,%20mining-energy,%20trade-industry

5.0 RECOMMENDED THRESHOLD DECISIONS AND MITIGATION ACTIONS (INCLUDING MONITORING AND EVALUATION)

5.1 Categorical Exclusion for the following activities:

- Environmental Assessment Activities.
- Design with alternatives for construction and management of the new system.
- Irrigation System Agricultural Development Plans.

- Social Assessment of the affected region.
- Technical Assistance.

5.2 A Positive Threshold Decision IAW 22 CFR 216(a)(2)(iii) is recommended for the following activities that could have significant impact on the environment:

- Construction of the Main, subsidiary irrigation canals, flood control and water flow control structures.
- Social concerns about permanent relocation of people directly affected by the construction, anthropological sites, cultural sites, land ownership, observation of women and minority rights, equitable access to water, etc.
- Assurance of appropriate environmental design of the systems for expected high flood stages.
- A required study of the hydrological conditions in the irrigated areas to identify potential
 impact on the ground water, surface water, disposal of drainage water, and potential for
 disruption of water based resources resulting from the new irrigation program.
- All other activities that fall within: Irrigation or water management activities, including dams and impoundments; Agricultural land leveling; Drainage projects; Large scale agricultural mechanization; New lands development; and Resettlement projects.
- Analysis of the potential impact on flora and fauna with emphasis on rare or endangered species and seasonal migratory species.

For the proposed actions that could have a significant effect on the environment, an Environmental Assessment shall be required pursuant to 22 CFR 216.3 (a) (4) and 22 CFR 216.7. The USAID Mission in Pakistan will perform the required environmental analysis as described in 22 CFR 216.6 and those activities required in ADS 204.

The first step in the EA Process will be to develop a **Scope of Environmental Assessment** (Scoping Statement) IAW 22 CFR 216.3 (a) (4)(i) and (ii). The Statement will address recommended changes in the Threshold Decision IAW 22 CFR 216.3 (a) (iv) if required.

The EA will work will include the following tasks as well as any additional tasks identified during the Scoping exercise:

- a. Review the environmental reports for Gomal Zam Dam Irrigation System, and prepare a summary for each project of the environmental issues, positive or negative impacts and proposed mitigations & monitoring (in tabular form) for the scope of activities under the project. Highlight any changes in the environmental conditions and issues since the existing (original) reports and start-up of construction.
- b. Describe the areas as they currently exist with the ongoing construction of the irrigation system. This task will require an on-site assessment in the field and should cover different areas impacting the environment such as physical, biological, climate, water

resources, geology and socio-economic. Construction and operation practices, on-going supervision as well as implementation of environmental mitigation and monitoring measures (and Contractor capabilities) as proposed in the original IEE/EA shall be reviewed and documented. Determine the significance of existing and potential adverse environmental and social impacts due to construction and operation of the irrigation system and update or develop an Environmental Monitoring and Mitigation Plan (EMMP).

- Review comments of USAID Environmental Officers and address all concerns.
- d. Develop a comprehensive and detailed Gomal Zam Dam Irrigation System EMMP with budget and responsibilities that comply with GOP and USAID/USG environmental regulations and best international practices. (See Attachment 1)
- e. Develop an EMMP monitoring and evaluation (M&E) reporting system for all mitigations recommended in the EA. This will include development of report formats and reporting systems. In addition, all personnel in the M&E reporting system will receive training on how to properly perform and report on the required mitigations
- 5.3 The following table presents the summary of activities, environmental impacts and recommended threshold decisions.

Summary of recommended threshold decisions

Activities	Environmental Impact	Recommended Determination
Main canal; subsidiary canals; flood control structures; water flow control structures; drains; and distributaries;	 Location and construction of the Main, subsidiary irrigation canals, flood control and water flow control structures. Social concerns about permanent relocation of people directly affected by the construction, anthropological sites, cultural sites, land 	Positive Decision per 22 CFR 216.3 (a) (2) (iii), the conditions (with reference to the Pakistani laws and guidance in1-6 under Section 4) being use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID. All designs and locations of construction shall be environmentally sound and the EA should analyze this for the accepted design and location of the construction.

- ownership, observation of women and minority rights, equitable access to water, etc.
- Assurance of appropriate environmental design of the systems for expected high flood stages.
- A study of the hydrological conditions in the irrigated areas to identify potential impact on the ground water, surface water, disposal of drainage water, and potential for disruption of water based resources resulting from the new irrigation program.
- All other activities that fall within: irrigation or water management activities, including dams and impoundments;

An EMMP shall be prepared which will monitor compliance with the environmentally sound management and design and will ensure compliance with all OHS requirements acceptable to USAID. The EMMP will be approved by the Bureau Environmental Officer (BEO)/Astā.

OAPA

	agricultural land leveling; drainage projects; large scale agricultural mechanization; new lands development; and resettlement projects. • Analysis of the potential impact on flora and fauna with emphasis on rare or endangered species and seasonal migratory species.	
Construction activities including but not limited to construction camp operation, dust control, waste and debris disposal, noise control, runoff and water contamination from construction, rehabilitation of vegetation on disturbed sites, ,etc	Minor to Moderate.	Negative Determination with conditions per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance in1-6 under Section 4) being use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID. Mitigation activities will be follow best practices as defined and detailed I the above references.

An EMMP shall be prepared which will elaborate environmentally safe and waste management and ensure compliance with all internationally acceptable best practice requirements acceptable to USAID. EMMP will be approved by the BEO/Asia.

This EMMP will have both reporting requirements and training to those that do the

5.4 Limitations

This assistance doesn't cover activities involving:

1. Assistance, procurement or use of pesticides or of genetically modified organisms (GMOs).

assessed.

monitoring to insure that the monitoring and reporting are properly complied with and

- 2. Development Credit Authority (DCA) or Global Development Alliance (GDA) programs.
- 3. Procurement or use of Asbestos Containing Materials (ACM) or other toxic/hazardous materials prohibited by US EPA as provided at: http://www.epa.gov/asbestos and/or under international environmental agreements and conventions, e.g. Stockholm Convention on Persistent Organic Pollutants as provided at: http://chm.pops.int.
- 4. Assistance for the procurement, use or recommendation for use of pesticides.

5.5 Revisions

In accordance with 22 CFR 216.3(a) (9), if new information becomes available which indicates that activities to be funded by the Program might be "major" and the Program's effect "significant," the Negative Determination will be reviewed and revised by the originator of the project and submitted through the Mission Environmental Officer to the BEO/Asia for approval and, if appropriate, an environmental assessment will be prepared.

APPROVAL OF ENVIRONMENTAL ACTION RECOMMENDED:

CLEARANCES:

Director, Office of Agriculture (A)		1/3/11	
	Diana Swain	Date	
Deputy Mission Environmental Officer	(CH) HA	: ;	
	Albert Merkel	Date	
Regional Environmental Advisor/Asia	Cleared by e-mail	12/27/2010	
	Andrei Barannik	Date	
Senior Deputy Mission Director	Roden Dan	1/3/11	
	Rodger Garner	Date	
APPROVAL:			
Mission Director	Robert	1/4/11	
	Andrew Sisson	Date	
Bureau Environmental			
Officer/Asia	Soon Vyson	1/11/11	
OAPA	Gordon Weynand	Date	
Communication graphs of the second se	Livin view min	The state of the s	

OAPA TRACKING # ! OAPA-11-JAN-PAK-DOII

Attachment 1

Sample Environmental Mitigation & Monitoring Plan (EMMP)

- An EMMP should either be included in or developed for (1) all IEEs that have at least one "Negative Determination with Conditions" (or for activities for which an environmental review has been completed pursuant to an IEE requirement) and (2) all Environmental Assessments (EAs).
- If the EMMP is not developed as part of the IEE, the implementing partner should usually lead development of the EMMP, subject to review and oversight by the MEO and COTR/AOTR.
- In all cases, the tasks identified in the EMMP are incorporated into the implementing partner's Work Plan, budget, and reporting.
- The following EMMP format is recommended. It can be adapted, as necessary.

Environmental Mitigation and Monitoring Plan

Activity Title:

Implementing Partner:

Activity	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Party(ies) Responsible	Indicative Budget
List all activities in IEE that received a "negative determination with conditions." Do not list any other activities in separate rows.	If mitigation measures are well-specified in the IEE, quote directly from IEE If they are not well-specified in the IEE, define more specifically here.	Specify indicators to (1) determine if mitigation is in place and (2) successful. For example, visual inspections for seepage around pit latrine; sedimentation at stream crossings, etc.)	For example: "monitor weekly, and report in quarterly reports. If XXX occurs, immediately inform USAID activity manager."	If appropriate, separately specify the parties responsible for mitigation, for monitoring and for reporting.	

Merkel, Albert (USAID/Pak/PDU)

From:

Andrei Barannik

Sent:

Monday, December 27, 2010 7:48 PM

To:

Merkel, Albert (USAID/Pak/PDU)

Cc:

(USAID/CAR/PS)

Barannik, Andrei

Subject: Re: FW: Clearance of attached IEE

Albert -

While on home leave, I've reviewed and have one: please add reference to the Gomal Zam dam IEE and EMMP approved by BEO/Asia (date & BEO/Asia tracking No.) you may also wish to digest & refer to the Condtons from this IEE.

With the above, please have the IEE duly signed in the Mission, put "concured by e-mail" on the REA/Asia line and send it to Gordon Weynand, BEO/OAPA for his review and clearance.

BRgds from Washington, Andrei

P.S. You may also draft SOW for Scoping and ask Gordon to review and clear it - this will help to review and process Scoping Statement faster.

-- On Mon, 12/27/10, Merkel, Albert (USAID/Pak/PDU) < AMerkel@usaid.gov> wrote:

From: Merkel, Albert (USAID/Pak/PDU) <AMerkel@usaid.gov>

Subject: FW: Clearance of attached IEE

Date: Monday, December 27, 2010, 6:18 AM

Incase you did not see this.

Albert L. Merkel

Scnior Design Advisor

Project Design Unit

Program Office

Ex: 2857

0308 555-1071

From: Merkel, Albert (USAID/Pak/PDU)

Sent: Monday, December 27, 2010 12:20 PM

To: Barannik, Andrei (USAID/CAR/PS)

wain, Di

Subject: Clearance of attached IEE